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The Monitoring and Evaluation System of the Millennium Villages Project- Potou/Senegal: Close Look at the Mid- term Evaluation Report

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Abstract

This paper explores the monitoring and evaluation system of the Millennium Villages Project in Potou, rural Senegal. It specifically focuses on the first evaluation report undertaken in 2009 after three years of intervention to assess the impacts of the project on communities in Potou. Theory of change, causal attribution, scaling-up, use of evaluation, and learning are the key issues that are addressed throughout the paper. Interviews with beneficiaries and project staff as well as the analysis of the project's evaluation report revealed that the project has created many positive impacts in the communities of Potou. However, unintended negative results have been observed in the sectors of education, health, and agriculture. Given the weaknesses that have been identified in the evaluation method, this paper suggests some strategies to strengthen the methodology of future evaluations, thus allowing for distinct attribution of the impacts to the project.

Author's Note

Kinda is an economist working on the issues of development with a focus on monitoring and evaluation. He has participated in field work in the Millennium Villages Project in Senegal addressing evaluation issues.

Keywords: Attribution, Evaluation, Method, Millennium Villages, Potou.

1. Introduction

The Millennium Villages Project (MVP) was launched in 2006 in ten African countries, including Senegal. It focuses on achieving the Millennium Development Goals (MDGs) and helping develop strategic sectors with local leaders in communities.

In Senegal, the intervention site of the MVP is the rural, northwestern community of Leona. The project seeks to have a great positive impact in that locality, and thus MDGs are monitored and evaluated to ensure this purpose.

Monitoring and evaluation (M&E) are essential in managing development projects. A good M&E system enhances the action of a project, such as the MVP-Potou, and ensures the development of learning and knowledge. M&E are accepted by many experts as key ingredients to a successful project life.

The MVP-Potou has its own M&E tool that was designed by the headquarters of the MVP located in New York. The monitoring system provides MVP with the instruments and tools it needs to collect information in project areas and thus evaluate its progress, achieved objectives, and allocation of resources. Conducting evaluations of its interventions since 2009, MVP has been able to identify some of its accomplishments. Beyond these achievements, though, is there plausible evidence for the advancement of learning, generation of knowledge, and causal attribution produced from the project?

The paper explores the M&E tools of MVP-Potou and analyzes the 2009 mid-term evaluation report results with a close look at the methodological approach used. Drawing from a literature review, interviews with key actors in Potou, and personal observation, the paper is organized as follows. First, it provides a background of the MVP-Potou as well as an overview of its M&E system. Then, there is an examination of the main results in the 2009 evaluation and their internal and external validity. Finally, the lessons learned are addressed.

2. The Millennium Villages Project:¹ The Case of Potou-Senegal

At the Millennium Summit in September 2000, world leaders set forth quantified and time-bound goals, known as the Millennium Development Goals (MDGs), to alleviate key development problems across the world. The Millennium Villages Project was thus established with the joined efforts of the Earth Institute of Columbia University, NGO Millennium Promise, and United Nations Development Program (UNDP) to aid communities in developing countries suffering from poverty. By employing well-targeted and practical inputs, the MVP can help guide communities to a path leading to self-sustaining development (Kanter et al, 2009).

The MVP argues that poor villages can overcome underdevelopment issues by 2015 if they are empowered with efficient and modern technologies. Countries participating in the MVP were selected with regards to community poverty levels, potential of agro-ecological zones, standards of good governance, stability, and commitment to the idea of achieving the MDGs. Another important criterion was that at least 20% of a country's children under the age of five years old are malnourished (MVP, 2009b).

The MVP reaches nearly a half million people across fourteen sites in ten countries in sub-Saharan Africa. In the first five-year phase, each of the Millennium Villages had a donor budget for core interventions of \$60 per capita (\$24 million total) per year, half of the total project budget.

Of this per capita budget, \$110 directly supported MVP interventions in agriculture, education, health, infrastructure, gender equality, and business development, and \$10 was budgeted for establishing, training, and paying local staff to lead the village-based systems in each MVP site (MVP, 2011b, p.12).

¹Throughout the paper, the use of MVP will refer to the Millennium Villages Project while MVP-Potou applies to the case of Senegal.

In Senegal, the area covered by the MVP consists of 6 Millennium Villages (MV) located in the rural community of Leona with Potou as pilot MV. The 6 MV are sub-zones, or groups of villages, each having between 4000 and 7,000 inhabitants living in the same administrative unit (MVP, 2009a). The rural community of Leona has an area of 415 square kilometers and is made up of 32,218² inhabitants located within 106 villages (MVP, 2011a).

Each MVP site includes a research village or MV1 (e.g. MV-Potou in Senegal) covering approximately 5,000 persons. These sites participate in research activities, such as answering household surveys to contribute to data collection. Potou, the pilot Millennium Village, has a population of 7,264 people and covers 16 villages of the 106 villages within the intervention area.

Although all interventions concern the rural community of Leona, this paper is structured around the MV Potou. The objectives of the MVP-Potou stem from the MDGs and focus on the following components: agriculture and environment, development of business enterprises, infrastructure, education, and health and nutrition.

On a subsidiary basis, “local governance and sustainable strategies” can be included as components through which the MVP-Potou seeks to provide the rural community of Leona with mobilized technical, financial, and negotiation resources. The approach developed by MVP-Potou is intended to be participative and gender sensitive.

The first project phase was spread over 5 years and provided mostly free services to achieve “quick-wins” in its components. The second phase that was recently launched in 2011 is a logical continuation of the first phase. However, the second phase differs from the first by which it seeks to promote a support of local actors in exchange of a financial contribution.

3. Monitoring and Evaluation System of the MVP-Potou

The MVP-Potou has a system of M&E that can be presented in the table 1 below.

² This is the target of the project interventions.

Table 1: system of M&E of the MVP-Potou

Monitoring & Evaluation Lines	Activities/ Interventions	Responsibilities	Periodicity	Methods/Monitoring & Evaluation Tools/Data Source	Scope	Resources
<ul style="list-style-type: none"> – Assessment of the impact of the MVP interventions on accelerating progress toward MDG targets – Review of costs of the interventions and the contribution of project partners relative to the \$120 per capita cost ceiling of the project – Performance monitoring of the adequacy, uptake, and coverage of project interventions – Qualitative implementation science that documents the timing and sequence of interventions, alongside key barriers and facilitators to implementation 	<ul style="list-style-type: none"> – Education: supply of free school infrastructures – Health: improving the geographical accessibility and health coverage (free basic health services supply), development of communication for behavior change – Water and sanitation: water connections, civil engineering, supply of sanitation regulatory devices – Energy, ICT, Roads: maintenance of facilities, introducing new technologies and promoting good practices (improved stoves, etc.), technical support – Environment: reforestation, development of natural reserves, technical support – Agriculture/Fisheries/Livestock: technical and financial support – Business enterprises development: entrepreneurship development <p><i>Key points transversal to all sectors:</i></p> <ul style="list-style-type: none"> – Strengthening skills and capacities of actors – sensitization of beneficiaries 	<ul style="list-style-type: none"> – The managers of each component are in charge of monitoring interventions – Sharing responsibilities in some cases between managers of components – Monitoring committees located within the MV are actors of monitoring 	<ul style="list-style-type: none"> – Monthly, quarterly and annual monitoring of activities – Evaluations: baseline (2009), midterm, final first phase evaluation, final evaluation of the project (2015) 	<p>Methods/ Instruments</p> <ul style="list-style-type: none"> – Surveys – Annual work plans – Registers – Periodical reports – Conventions – Computerized database – Planning and dialogue meetings – Supervision missions – Millennium Villages Information System (MVIS) <p>Sources</p> <ul style="list-style-type: none"> – Specific survey data – Reports data – MVIS data – Data from a single component or multiple components of the project 	<ul style="list-style-type: none"> – Coverage – Costs – Achievements/ progress – Challenges – Recommendations – Qualitative learning 	<ul style="list-style-type: none"> – Experts¹ in charge of the project components and specialists in finance, communication, administration, accounting, and monitoring and evaluation – Governmental services agents – Monitoring and evaluation department: includes an experienced statistician (data manager) and three data entry operators – “Field teams” composed of agricultural technicians, nurses, midwives, community workers (installed in the rural community) facilitates the implementation of interventions – Financial resources (from west Africa focal point of the project (Mali) or the headquarters)

Source: self-construction, 2012

³ There is a recurring mobility of the MVP-Potou staff. This is a risk factor to be taken into account during the planning of the project activities.

The MVP-Potou is led by a team of individuals and experts divided among the various components of the project. In the 6 Millennium Villages in the rural community of Leona, M&E committees were organized in areas related to the 5 components of the project: agriculture and environment, health and nutrition, education, infrastructure, and business enterprise development. The community with the help of the rural council defined the criteria for the selection of M&E committees. These committees assisted with project implementation, including identification of problems, planning, implementation, and monitoring of interventions.

Monitoring ensured the effectiveness of the timing, sequencing, and progress of interventions. The information system of the projects of the Millennium Villages (Millennium Villages Information System (MVIS))⁴ was established specially to facilitate the monitoring of the MDGs' indicators. This allowed different sites to monitor MDG indicators, such as birth rate, immunization coverage, and mortality rate. This information helped identify the main gaps in staffing, services, and infrastructure.

The project team analyzed all the reports to learn about the project interventions in the field. If the data showed inefficiency, the team would reframe the project's approaches. Each report was sent to the headquarters of MVP in New York, which provides checks and balances in decision making with the office of MVP-Potou. The MVP-Potou chain of results followed an inputs-activities-results model. The examination of the relationship between activities and outputs allowed for the measurement of all components in order to see what extent to which the results have been achieved or not. According to the head of M&E, "evaluating the cost of interventions follows a cost-benefit analysis in order to assess the profitability of the interventions."

As mentioned in Table 1 above, the overall project design incorporated a set of evaluations. As such, data collected at both baseline and year 3 were the main steps of the overall approach implemented to make a first evaluation of the project.

4. Evaluation Methodology

4.1 The Baseline Data Collection Method

Data collection through surveys in the pilot MV monitored the progress towards achieving MDGs. The surveys focused on the different components of the project. A population census before the implementation of the project allows for the collection of detailed data on households and population characteristics. Questionnaires designed in accordance with the requirements of each segment were administered to a random sample of 300 households. A set of indicators⁶ was used to collect information on the MDGs. The database manager and project coordinators

⁴ As an illustration of the information system of the MVP-Potou; the "ChildCount+" is an initiative to collect information concerning the nutritional status of children and pregnant women.

⁶ Over the implementation of the project, it was necessary to adjust some indicators because they were not appropriate.

identify the accomplishments and challenges of each sector. If needed, managers and coordinators provide other courses of action for struggling sectors. They also mentioned the specific support needs (managerial, scientific, operational and technical support) that their MVP Programme has in the area. Thus, if needed, the MVP-Potou can request assistance from the West African regional MVP office based in Mali.

The surveys were conducted by teams located in different project sites between December 2006 and September 2007. The introduction of a number of women investigators addressed the sensitivity of surveys relevant to women (MVP, 2009a).

4.2 Project Impacts Evaluation After 3 Years of Intervention

To assess the impact of the intervention of MVP, the project uses the approach “Before versus after.”⁷ It incorporates socio-economic and detailed health surveys, plus an anthropometric and biological monitoring among 300 randomly selected households, stratified by wealth at the beginning of the project and three years after the project intervention. Surveys that were conducted in the Millennium Village Potou cover only 21% of the total population in the rural community of Leona.

These surveys have been programmed in order to coincide with the pre-harvest⁸ for both periods. The data of crop yields were estimated from surveys of plots. As such, biophysical data were collected randomly from 30 plots in Potou. Control villages were not originally included in the design of the project evaluation. Thus, they were recently introduced in MVP-Potou to better evaluate the project’s impacts (MVP, 2009b).

In a neighboring rural community, five control villages were selected from a larger number of “candidate villages.” The choice of these villages was based on their similarity with the intervention villages in Potou, namely according to agro-ecological, geographical, socio-economic, and demographic parameters. Operationally, about 324⁹ households were selected for data collection.

5. Overall Character of Taking Stock: Discussion

MVP-Potou recorded positive progress in several of its components with more pronounced achievements in some areas than in others in three years of intervention. However, unintended negative effects were observed mainly in education, health, and agriculture (cf table 2).

⁷ This approach consists of comparing households at a given period (in our case, third year of the project intervention) to the same households of the baseline.

⁸ This period was chosen to help maximize the socioeconomic and nutritional vulnerability data collection.

⁹ The innovation in this number is that it takes into account the growth of the population.

Table 1 : key results of the mid-term survey

Components	Indicators	Baseline	Year 3	Comments
Agriculture	Chronic undernutrition (stunting) among children under two years	30.77%	31.93%	Increasing food production and income in Potou has not improved nutrition conditions. To improve nutrition, the project undertook to make a CMAM (Community Based Management of Acute Malnutrition).
Water and sanitation	Proportion of population using an improved drinking water source	19,8	78,1	A partnership was established between the project and the Millennium Drinking Water and Sanitation Program (PEPAM) of Senegalese government. 81 boreholes were built to make water safe drinking geographically accessible to the public.
	Primary Type of Sanitation Facility	Improved	29,4%	Access to improved sanitation has been improved in MV Potou.
		Unimproved	76,8%	
		Open defecation	68,5%	
Education	Gross attendance rate in primary education ¹	71.9%	74.1%	The gross and the net rate of children enrolled in primary schools experienced a slight increase. Despite the gratuity of primary education, the effects are not immediate. In fact, the monitoring system shows that cultural and religious factors present many challenges. A majority of parents prefer to send their children in Koranic schools. The project aims to build a partnership with teachers in Koranic schools by providing a subsidy so that they can agree to let their students benefit from courses in French schools.
	Net attendance rate ² in primary education	45.1%	53.2%	
Health	Proportion of women receiving at least one antenatal visit	87.1%	93.3%	An improvement of various indicators concerning maternal health and management of malaria, tuberculosis, and HIV/AIDS was recorded. However, challenges remain regarding child health. For example, the monitoring of beneficiaries of bed nets shows that the bed nets are not used for intended causes.
	Proportion of children under five sleeping under insecticide-treated bed nets	13.8%	29.2%	
	HIV testing in last year	0.6%	10.5%	
Infrastructures (ICT)	Household cell phone ownership	39,6%	84,1%	The proportion of households owning a cell phone in Potou has increased.

Source: Self-elaboration from the midterm evaluation report, 2012

¹⁰ The gross attendance ratio (GAR) is the number of children attending primary school regardless of age, expressed as a percentage of the total children of official primary-school age.

¹¹ The net attendance ratio (NAR) is the percentage of children in the official primary school age bracket (6-11) actually attending school.

The project proved to be both influential and beneficial; it satisfied the expectations of the beneficiaries as well as its intended objectives. Interviews with beneficiaries have confirmed this statement. There is a concordance between the project and national programming frameworks, notably the Strategy for Growth and Poverty Reduction Strategy Paper (DSRP), which shows that the project also took into account national priorities and needs.

However, several issues, such as individual reluctance, culture, and religion, impede the project's effectiveness. Due to these issues, the project has struggled to generate positive effects in education, health, and agriculture. According to a school director in Potou, "the project needs to find ways to collaborate with the koranic schools in order to have a great visibility so that parents could allow their children to attend the French schools."

There is a probability that the observed results reflect the interventions of private and state institutions and NGOs. This implies that the results obtained at the MV-Potou, and more widely in the rural community of Leona, cannot be exclusively attributable to the project resources.¹² Thus, the effectiveness of MVP-Potou determined by the mid-term evaluation is unreliable. A different timescale and method is needed to better understand the impacts and effects of MVP-Potou. For the head of M&E of the project, "many efforts need to be made in terms of monitoring to ensure the reliability of data notably in agriculture and health; the team for M&E's purpose should also be strengthened by additional persons with good and strong skills."

Evaluation methods should produce empirical evidence (UNDP, 2009). Specifically, impact evaluations are generally designed to estimate the average impact of a program on the welfare of beneficiaries (Gertler et al., 2011). The approach employed must be valid to ensure that the effects are attributable to a given project. Authors have identified deficiencies¹³ and criticized the evaluation method used by the MVPs. Although the study protocol recognizes these deficiencies, the issues are not always fully addressed. For example, the protocol said that the lack of baseline data on control villages is a limit (MVP, 2009b, p.20). It added that the introduction of control villages would make a more coherent evaluation in terms of causality.

5.1 The Selection of Intervention Sites

The sites selected for intervention were chosen based on their agro-ecological potentials and poverty levels. However, these criteria lacked statistical rigor, which denoted a selection bias for the project interventions. Rather, the choices were considered to be "reasoned" choices. Indeed, selection bias occurs when an individual's motives for participation in a given program are correlated with the results. This could challenge achievements claimed by the program. In the case of

¹²It is possible to implement an impact evaluation controlling for spillover effects from other projects or programs but it is not as obvious as such.

¹³The deficiencies were noted by authors such as Clemens and Demombynes (2010) and discussed on several blogs. Both the approach of the MVP and the method of evaluation are the subject of discussions by researchers and evaluators (Clemens, 2010; Fresch, 2009a, 2009b).

MVP, the criteria of good governance and potential related to agro-ecological zones can make a priori beliefs that the results of these projects will be good (Clemens, Demombynes, 2010).

5.2 The Comparability of Villages

In the mid-term review, treated villages were compared to the same villages before the intervention. The “before versus after”¹⁵ method employed during evaluation provides simple and straightforward results, but it neglects to address whether or not the indicators of interest would change in the absence of the project.

The MVP requires a rigorous impact approach because of its complexity and goal to achieve the MDGs as well as be a successful model for the rest of the world to follow. A rigorous impact evaluation requires a valid comparison group¹⁶ (valid counterfactual). For example, the randomized control trial is widely accepted by evaluators as one of the strongest methods in assessing impacts and allowing for causal attribution.

As noted also by Bamberger et al. (2006, p.351), to get valid results within an experimental or quasi-experimental study, data on a control group in both the reference period and ex-post are required. This, however, is not the case of the MVP-Potou and for the MVPs in general.

5.3 Challenge of Introducing Control Villages

The introduction of control villages in the MVP-Potou is an attempt to improve the evaluation methodology, but it implies many considerations. First, the introduction of control villages questions the internal validity of the evaluation. In other words, if the control villages serve their intended purpose, do they therefore provide a valid estimate of the counterfactual? How should observed characteristics be balanced? How should unobservable characteristics be taken into account? How much weight should be placed on the criteria?

One of the major challenges of MVP-Potou is determining the reliability of the control villages. If the control villages are unreliable, they will negatively affect the quality of future evaluations. In addition, the selection of indicators is significant in the monitoring and evaluation of a project. Some of the baseline indicators chosen by the MVP-Potou, such as anthropometry, were subsequently adjusted because they were unreliable. Therefore, particular attention should be given to indicators.

There is also a pessimism that has grown around the millennium villages due to previous unsatisfactory results from other forms of village projects. Examples

¹⁵ This method is seen as a counterfeit estimate of the counterfactual (Gertler et al, 2011).

¹⁶ A valid comparison group will have the same characteristics as the group of beneficiaries of the program (treatment group), except that the units in the comparison group do not benefit from the program. Comparison groups are used to estimate the counterfactual (Gertler, 2011).

include the *mofan* villages in rural China (1930-1970) and the later Southwest project¹⁷ also in China, which was a similar model to the MVP in the 1990s. Ineffective evaluations of these projects are the major reasons behind this discontent.

Additional analysis concerns the scaling up and sustainability of the MVPs. The possibility of scaling up and ensuring the sustainability of the MVP is analyzed by many authors (Buse et al., 2008a, 2008b, 2008c) who conclude that these goals require the investment in infrastructure, quality human resources, rural and urban inter-sectoral links, government commitment, and donor support. They also add that it is necessary to have a suitable village model that minimizes the costs of interventions.

The designers and managers of MVP responded to the previous critics by further explaining the cost entailed by the randomization of the villages, the ethical considerations taken into account during intervention (Sanchez et al., 2007), and the project's foundation based on the experimental model of *learning by doing*.

5.4 Proposition of Potential Solutions

Solution scenarios are proposed by authors to address the challenges of measuring the "stringent" impacts of the project. The literature on this subject recommends a randomized trial, which is, however, impossible at this stage of progress in the MVPs. To better determine the effects of the MVP-Potou and, more generally the MVPs, a single method should not be preferred. It is critical to take advantage of the robust selection of methods.

The impacts of the project should be assessed by combining a "Propensity Score Matching" method and "double difference" method rather than the "before versus after" method, which implies a counterfeit counterfactual. Depending only on the before-and-after method does not accurately portray the outcomes of the project since other factors are likely to have influenced the results founded by the MVP.

The "Propensity Score Matching" is a technique that statistically creates comparable groups based on an analysis of the factors that influence people's propensity to participate in a program. For each unit in the treatment group and group of non-enrollees, the probability of a unit in the program is computed by observing the value of its characteristics, also known as its "propensity score." The program's impact is then estimated by comparing the average outcomes of a treatment or enrolled group and the average outcome among a statistically matched subgroup of units, the match being based on observed characteristics available in the data at hand (Gertler et al, 2011).

The "double difference" method compares the "before-and-after difference" of the groups that underwent intervention with the "before-and-after difference" of the groups that did not experience intervention. These two methods are powerful statistical tools that can be used together when assignment rules are unclear. In addition, the "double difference" and "Propensity Score Matching" methods are useful in assessing the project and making comparisons between variables.

¹⁷See Chen, Shaohua, Ren Mu, and Martin Ravallion (2009).—Are there lasting impacts of aid to poor areas? *Journal of Public Economics* 93 (3–4): 512–528.

In addition to the quasi-experimental methods mentioned above, other methods should be considered for assessing the effects of the project. These methods can involve the input of beneficiaries and project specialists. For example, the beneficiaries can provide narratives about the progress and impacts of the project. This will reveal any additional influences acting in the area of the project. It would also allow for project specialists to establish which impacts were connected to the project intervention.

The method of Multiple Lines and Levels of Evidence (MLLE) is also a useful method that examines the causal relationship between actions and effects. This method reviews the factors that support a causal relationship between intervention and observed impact. To achieve this, it considers the strength, consistency, specificity, temporality, coherence, and plausibility of the established relationship.

Drawing from this paper's research, the scaling-up of the MVP-Potou is not an option. A consistent learning from intervention is fundamental to ensuring the external validity of the project actions.

6. Conclusion and Way Forward

The system of M&E of the MVP-Potou allows managers to learn from interventions, notably through periodic qualitative assessments that are performed by the project in collaboration with communities, government, and other partners. The community is associated with the planning, the implementation, and the M&E of the project. However, the monitoring committees need to be strengthened technically and institutionally to generate more effective synergies in MVP-Potou. Not only will this improve project monitoring, but it will also develop a real learning culture within the project.

The mid-term evaluation reveals the progress made in the project's various components. More efforts need to be made in the areas of education, health, and agriculture. Due to culture, religion, and lack of accurate data, addressing these areas of the project prove to be more difficult than others. Another major challenge is selecting a different evaluation method for the project, although the "before versus after method" is considered simple. Also, the recent introduction of control villages raises numerous thoughts on the reliability of these villages as a rigorous counterfactual.

Improvements were recorded on the Potou site, but the results should be interpreted with caution at this stage of the project. To accurately comment on the attribution and casualty of the project, the project must be examined on another time scale. This will also help assess how learning and the use of findings can enhance project interventions.

Ultimately, a number of considerations need to be addressed. Improving the SWOT (Strengths, Weaknesses, Opportunities, Threats) framework of the MVP-Potou could help improve the M&E system and contribute to the generation of learning and knowledge. Executive mobility is a risk factor that must be incorporated in planning. Another key point is that this mid-term evaluation can be perceived as partial since it is an internal evaluation. This may weaken its credibility and limit its use. Finally, the methodological approach for the assessment of the progress made

by the site needs to be strengthened particularly in terms of scientific inquiry as it affects the nature of the results and consequently their internal and external validity. The engagement of stakeholders vis-à-vis the use of evaluation findings can be enhanced and developed through their active involvement in the important decisions of future evaluations.

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